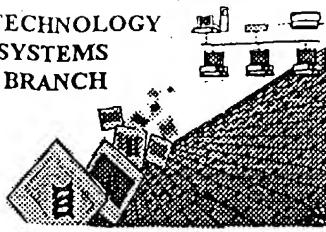


BIOTECHNOLOGY
SYSTEMS
BRANCH



RAW SEQUENCE LISTING
ERROR REPORT

The Biotechnology Systems Branch of the Scientific and Technical Information Center (STIC) detected errors when processing the following computer readable form:

Application Serial Number:

10/797,553

Source:

TFWO

Date Processed by STIC:

7/22/04

THE ATTACHED PRINTOUT EXPLAINS DETECTED ERRORS.

PLEASE FORWARD THIS INFORMATION TO THE APPLICANT BY EITHER:

- 1) INCLUDING A COPY OF THIS PRINTOUT IN YOUR NEXT COMMUNICATION TO THE APPLICANT, WITH A NOTICE TO COMPLY or,
- 2) TELEPHONING APPLICANT AND FAXING A COPY OF THIS PRINTOUT, WITH A NOTICE TO COMPLY

FOR CRF SUBMISSION AND PATENTIN SOFTWARE QUESTIONS, PLEASE CONTACT MARK SPENCER, TELEPHONE: 571-272-2510; FAX: 571-273-0221

TO REDUCE ERRORED SEQUENCE LISTINGS, PLEASE USE THE CHECKER VERSION 4.2 PROGRAM, ACCESSIBLE THROUGH THE U.S. PATENT AND TRADEMARK OFFICE WEBSITE. SEE BELOW FOR ADDRESS:

<http://www.uspto.gov/web/offices/pac/checker/chkrnote.htm>

Applicants submitting genetic sequence information electronically on diskette or CD-Rom should be aware that there is a possibility that the disk/CD-Rom may have been affected by treatment given to all incoming mail.

Please consider using alternate methods of submission for the disk/CD-Rom or replacement disk/CD-Rom.

Any reply including a sequence listing in electronic form should NOT be sent to the 20231 zip code address for the United States Patent and Trademark Office, and instead should be sent via the following to the indicated addresses:

1. EFS-Bio (<http://www.uspto.gov/ebc/efs/downloads/documents.htm>), EFS Submission User Manual - ePAVE)
2. U.S. Postal Service: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
3. Hand Carry, Federal Express, United Parcel Service, or other delivery service (EFFECTIVE 06/05/04):
U.S. Patent and Trademark Office, 220 20th Street S., Customer Window, Mail Stop Sequence, Crystal Plaza Two, Lobby, Room 1B03, Arlington, VA 22202

Revised 05/17/04

Raw Sequence Listing Error Summary

ERROR DETECTED

SUGGESTED CORRECTION

SERIAL NUMBER:

10/797,553

ATTN: NEW RULES CASES: PLEASE DISREGARD ENGLISH "ALPHA" HEADERS, WHICH WERE INSERTED BY PTO SOFTWARE

1 Wrapped Nucleic
Wrapped Aminos The number/text at the end of each line "wrapped" down to the next line. This may occur if your file was retrieved in a word processor after creating it. Please adjust your right margin to .3; this will prevent "wrapping."

2 Invalid Line Length The rules require that a line not exceed 72 characters in length. This includes white spaces.

3 Misaligned Amino
Numbering The numbering under each 5th amino acid is misaligned. Do not use tab codes between numbers; use space characters, instead.

4 Non ASCII The submitted file was not saved in ASCII(DOS) text, as required by the Sequence Rules. Please ensure your subsequent submission is saved in ASCII text.

5 Variable Length Sequence(s) contain n's or Xaa's representing more than one residue. Per Sequence Rules, each n or Xaa can only represent a single residue. Please present the maximum number of each residue having variable length and indicate in the <220>.<223> section that some may be missing.

6 PatentIn 2.0
"bug" A "bug" in PatentIn version 2.0 has caused the <220>.<223> section to be missing from amino acid sequences(s) . Normally, PatentIn would automatically generate this section from the previously coded nucleic acid sequence. Please manually copy the relevant <220>.<223> section to the subsequent amino acid sequence. This applies to the mandatory <220>.<223> sections for Artificial or Unknown sequences.

7 Skipped Sequences
(OLD RULES) Sequence(s) missing. If intentional, please insert the following lines for each skipped sequence
(2) INFORMATION FOR SEQ ID NO:X: (insert SEQ ID NO where "X" is shown)
(i) SEQUENCE CHARACTERISTICS: (Do not insert any subheadings under this heading)
(xi) SEQUENCE DESCRIPTION: SEQ ID NO:X: (insert SEQ ID NO where "X" is shown)
This sequence is intentionally skipped

8 Skipped Sequences
(NEW RULES) Please also adjust the "(ii) NUMBER OF SEQUENCES" response to include the skipped sequences
Sequence(s) missing. If intentional, please insert the following lines for each skipped sequence
<210> sequence id number
<400> sequence id number
000

9 Use of n's or Xaa's
(NEW RULES) Use of n's and/or Xaa's have been detected in the Sequence Listing.
Per 1.823 of Sequence Rules, use of <220>.<223> is MANDATORY if n's or Xaa's are present
In <220> to <223> section, please explain location of n or Xaa, and which residue n or Xaa represents.

10 Invalid <213>
Response Per 1.823 of Sequence Rules, the only valid <213> responses are: Unknown, Artificial Sequence, or scientific name (Genus/species). <220>.<223> section is required when <213> response is Unknown or is Artificial Sequence

11 Use of <220>
"bug" Sequence(s) missing the <220> "feature" and associated numeric identifiers and responses.
Use of <220> to <223> is MANDATORY if <213> "Organism" response is "Artificial Sequence" or "Unknown." Please explain source of genetic material in <220> to <223> section.
(See "Federal Register," 06/01/1998, Vol. 63, No. 104, pp. 29631-32) (Sec. 1.823 of Sequence Rules)

12 PatentIn 2.0
"bug" Please do not use "Copy to Disk" function of PatentIn version 2.0. This causes a corrupted file, resulting in missing mandatory numeric identifiers and responses (as indicated on raw sequence listing). Instead, please use "File Manager" or any other manual means to copy file to floppy disk.
"n" can only represent a single nucleotide; "Xaa" can only represent a single amino acid



IFWO

RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/797,553

DATE: 07/22/2004

TIME: 08:56:02

Input Set : A:\10797553.txt

Output Set: N:\CRF4\07222004\J797553.raw

3 <110> APPLICANT: Moyle, William R.
 4 Xing, Yongna
 6 <120> TITLE OF INVENTION: Protein Knobs
 8 <130> FILE REFERENCE: 268/279-RWJ-01-40
 C--> 10 <140> CURRENT APPLICATION NUMBER: US/10/797,553
 C--> 11 <141> CURRENT FILING DATE: 2004-03-10
 E--> 13 <160> NUMBER OF SEQ ID NOS: 56 *66 sequences, see page 9.*
 15 <170> SOFTWARE: PatentIn version 3.1

ERRORED SEQUENCES

Does Not Comply
 Corrected Diskette Needed

(pg. 1-10)

755 <210> SEQ ID NO: 24
 756 <211> LENGTH: 92
 757 <212> TYPE: PRT
 758 <213> ORGANISM: Artificial Sequence
 760 <220> FEATURE:
 761 <223> OTHER INFORMATION: hCG alpha-subunit with Cys substituted for Lys51
 763 <400> SEQUENCE: 24
 765 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
 766 1 5 10 15
 769 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
 770 20 25 30
 773 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
 774 35 40 45
 777 Val Cys Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
 778 50 55 60
 781 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
 782 65 70 75 80
 785

Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu
 E--> 786 1 5 10 15

789 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
 E--> 790 20 25 30
 793 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
 E--> 794 35 40 45
 797 Val Gln Cys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
 E--> 798 50 55 60
 801 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
 E--> 802 65 70 75 80
 805 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser
 E--> 806 85 90
 1183 <210> SEQ ID NO: 36
 1184 <211> LENGTH: 145

What
is this?

RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/797,553

DATE: 07/22/2004

TIME: 08:56:03

Input Set : A:\10797553.txt

Output Set: N:\CRF4\07222004\J797553.raw

1185 <212> TYPE: PRT
 1186 <213> ORGANISM: Homo sapiens
 1188 <400> SEQUENCE: 36
 1190 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
 1191 1 5 10 15
 1194 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
 1195 20 25 30
 1198 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
 1199 35 40 45
 1202 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
 1203 50 55 60
 1206 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
 1207 65 70 75 80
 1210 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
 1211 85 90 95
 1214 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
 1215 100 105 110
 1218 Pro Arg Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
 1219 115 120 125
 1222 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
 E--> 1223 130 135 140 *145*
 1226 <210> SEQ ID NO: 37
 1227 <211> LENGTH: 145
 1228 <212> TYPE: PRT
 1229 <213> ORGANISM: Artificial Sequence
 1231 <220> FEATURE:
 1232 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Ser138
 1234 <400> SEQUENCE: 37
 1236 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
 1237 1 5 10 15
 1240 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
 1241 20 25 30
 1244 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
 1245 35 40 45
 1248 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
 1249 50 55 60
 1252 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
 1253 65 70 75 80
 1256 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
 1257 85 90 95
 1260 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
 1261 100 105 110
 1264 Pro Arg Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
 1265 115 120 125
 1268 Pro Ser Pro Ser Arg Leu Pro Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
 E--> 1269 130 135 140 *145*
 1272 <210> SEQ ID NO: 38
 1273 <211> LENGTH: 145
 1274 <212> TYPE: PRT

RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/797,553

DATE: 07/22/2004

TIME: 08:56:03

Input Set : A:\10797553.txt

Output Set: N:\CRF4\07222004\J797553.raw

1275 <213> ORGANISM: Artificial Sequence

1277 <220> FEATURE:

1278 <223> OTHER INFORMATION: hCG beta-subunit residues 101-114 were replaced with their
hFSH b1279 eta-subunit counterparts, namely hFSH beta-subunit residues 95-10
1280 8

1282 <400> SEQUENCE: 38

1284 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
1285 1 5 10 151288 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1289 20 25 301292 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1293 35 40 451296 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1297 50 55 601300 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
1301 65 70 75 801304 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1305 85 90 951308 Thr Thr Asp Cys Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe
1309 100 105 1101312 Gly Glu Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
1313 115 120 125

1316 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln

E--> 1317 130 135 140

145

1320 <210> SEQ ID NO: 39

1321 <211> LENGTH: 145

1322 <212> TYPE: PRT

1323 <213> ORGANISM: Artificial Sequence

1325 <220> FEATURE:

1326 <223> OTHER INFORMATION: hCG beta-subunit residues 101-114 were replaced with their
hFSH b

1327 eta-subunit counterparts, namely hFSH beta-subunit residues 95-10

1328 8, and Serine38 in the beta-subunit carboxyterminus of this
1329 analog was replaced with cys

1331 <400> SEQUENCE: 39

1333 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
1334 1 5 10 151337 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1338 20 25 301341 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1342 35 40 451345 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1346 50 55 601349 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
1350 65 70 75 801353 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1354 85 90 951357 Thr Thr Asp Cys Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe
1358 100 105 110

1361 Gly Glu Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu

please explain whole sequence

What about
the remaining
sequence?Please explain
whole sequenceWhat
about
the
remaining
sequence?Please explain
whole sequence

RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/797,553

DATE: 07/22/2004

TIME: 08:56:03

Input Set : A:\10797553.txt

Output Set: N:\CRF4\07222004\J797553.raw

1362 115 120 125
 1365 Pro Ser Pro Ser Arg Leu Pro Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
 E--> 1366 130 135 140 145
 1729 <210> SEQ ID NO: 45
 1730 <211> LENGTH: 125
 1731 <212> TYPE: PRT
 1732 <213> ORGANISM: Artificial Sequence
 1734 <220> FEATURE:
 1735 <223> OTHER INFORMATION: hCGbeta,delta116-135,S138C
 1737 <400> SEQUENCE: 45
 1739 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
 1740 1 5 10 15
 1743 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
 1744 20 25 30
 1747 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
 1748 35 40 45
 1751 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
 1752 50 55 60
 1755 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
 1756 65 70 75 80
 1759 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
 1760 85 90 95
 1763 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
 1764 100 105 110
 1767 Pro Arg Phe Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
 E--> 1768 115 120 125
 1863 <210> SEQ ID NO: 48
 1864 <211> LENGTH: 140
 1865 <212> TYPE: PRT
 1866 <213> ORGANISM: Artificial Sequence
 1868 <220> FEATURE:
 1869 <223> OTHER INFORMATION: hCGbeta,delta131-135,S138C
 1871 <400> SEQUENCE: 48
 1873 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
 1874 1 5 10 15
 1877 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
 1878 20 25 30
 1881 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
 1882 35 40 45
 1885 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
 1886 50 55 60
 1889 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
 1890 65 70 75 80
 1893 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
 1894 85 90 95
 1897 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
 1898 100 105 110
 1901 Pro Arg Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
 1902 115 120 125

Please see error explanation on page 12.

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/797,553

DATE: 07/22/2004
TIME: 08:56:03

Input Set : A:\10797553.txt
Output Set: N:\CRF4\07222004\J797553.raw

E--> 1905 Pro Ser Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
 1906 130 135
 2143 <210> SEQ ID NO: 56
 2144 <211> LENGTH: 10
 2145 <212> TYPE: PRT
 2146 <213> ORGANISM: Artificial Sequence
 2148 <220> FEATURE:
 2149 <223> OTHER INFORMATION: X1-Asp-Asp-Asp-Asp-Lys-Ser-Ym-Cys-Zn, where X, Y, and Z refer to

any tail portion amino acids and l, m, and n refer to the lengths of the tail portion amino acids

2153 <220> FEATURE:
 2154 <221> NAME/KEY: MISC_FEATURE
 2155 <223> OTHER INFORMATION: Xaa refers to any tail portion amino acids and n refers to the

lengths of the tail portion amino acids

2160 <400> SEQUENCE: 56

E--> 2162 Xaa Asp Asp Asp Asp Lys Ser Xaa Cys Xaa - DO NOT show "N" in the sequence, "Xaa" can E--> 2163 1 5 10
 2167 <210> SEQ ID NO: 57 Found 107 Artificial only represent one
 2168 <211> LENGTH: 92 amino acid. See item #5 on error summary sheet.
 2169 <212> TYPE: PRT

C--> 2170 <213> ORGANISM: Artificial Sequence
 2172 <220> FEATURE:

2173 <223> OTHER INFORMATION: An hCG truncated (-subunit analog fused to the hCG alpha-carboxyterminus

2175 <400> SEQUENCE: 57
 2177 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
 2178 1 5 10 15
 2180 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
 2181 20 25 30
 2183 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
 2184 35 40 45
 2186 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
 2187 50 55 60
 2189 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
 2190 65 70 75 80
 2192 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser Asp Asp Pro Arg
 E--> 2193 85 90 85 95 90 95

2195 Phe Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln

E--> 2196 100 105 100 105

2198 <210> SEQ ID NO: 58

2199 <211> LENGTH: 145

2200 <212> TYPE: PRT

2201 <213> ORGANISM: Artificial Sequence

2203 <220> FEATURE:

2204 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Arg94

2206 <400> SEQUENCE: 58

2208 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu

2209 1 5 10 15

2212 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr

2213 20 25 30

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/797,553

DATE: 07/22/2004
TIME: 08:56:03

Input Set : A:\10797553.txt
Output Set: N:\CRF4\07222004\J797553.raw

2216 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
 2217 35 40 45
 2220 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
 2221 50 55 60
 2224 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
 2225 65 70 75 80
 2228 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Cys Arg Ser
 2229 85 90 95
 2232 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
 2233 100 105 110
 2236 Pro Arg Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
 2237 115 120 125
 2240 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2241 130 135 140 145
 2244 <210> SEQ ID NO: 59
 2245 <211> LENGTH: 145
 2246 <212> TYPE: PRT
 2247 <213> ORGANISM: Artificial Sequence
 2249 <220> FEATURE:
 2250 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Arg95
 2252 <400> SEQUENCE: 59
 2254 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
 2255 1 5 10 15
 2258 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
 2259 20 25 30
 2262 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
 2263 35 40 45
 2266 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
 2267 50 55 60
 2270 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
 2271 65 70 75 80
 2274 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Cys Arg Ser
 2275 85 90 95
 2278 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
 2279 100 105 110
 2282 Pro Arg Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
 2283 115 120 125
 2286 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2287 130 135 140 145
 2290 <210> SEQ ID NO: 60
 2291 <211> LENGTH: 145
 2292 <212> TYPE: PRT
 2293 <213> ORGANISM: Artificial Sequence
 2295 <220> FEATURE:
 2296 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Ser96
 2298 <400> SEQUENCE: 60
 2300 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
 2301 1 5 10 15
 2304 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/797,553

DATE: 07/22/2004
TIME: 08:56:03

Input Set : A:\10797553.txt
Output Set: N:\CRF4\07222004\J797553.raw

2305	20	25	30
2308	Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val		
2309	35	40	45
2312	Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe		
2313	50	55	60
2316	Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val		
2317	65	70	75
2320	Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Cys		
2321	85	90	95
2324	Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp		
2325	100	105	110
2328	Pro Arg Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu		
2329	115	120	125
2332	Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln		
E--> 2333	130	135	140
2335	<210> SEQ ID NO: 61		
2336	<211> LENGTH: 145		
2337	<212> TYPE: PRT		
2338	<213> ORGANISM: Artificial Sequence		
2340	<220> FEATURE:		
2341	<223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Thr97		
2343	<400> SEQUENCE: 61		
2345	Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu		
2346	1	5	10
2349	Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr		
2350	20	25	30
2353	Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val		
2354	35	40	45
2357	Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe		
2358	50	55	60
2361	Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val		
2362	65	70	75
2365	Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser		
2366	85	90	95
2369	Cys Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp		
2370	100	105	110
2373	Pro Arg Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu		
2374	115	120	125
2377	Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln		
E--> 2378	130	135	140
2380	<210> SEQ ID NO: 62		
2381	<211> LENGTH: 145		
2382	<212> TYPE: PRT		
2383	<213> ORGANISM: Artificial Sequence		
2385	<220> FEATURE:		
2386	<223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Thr98		
2388	<400> SEQUENCE: 62		
2390	Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu		
2391	1	5	10
			145

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/797,553

DATE: 07/22/2004
TIME: 08:56:03

Input Set : A:\10797553.txt
Output Set: N:\CRF4\07222004\J797553.raw

2394 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2395 20 25 30
2398 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2399 35 40 45
2402 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2403 50 55 60
2406 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2407 65 70 75 80
2410 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
2411 85 90 95
2414 Thr Cys Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2415 100 105 110
2418 Pro Arg Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2419 115 120 125
2422 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2423 130 135 140 *145*

2425 <210> SEQ ID NO: 63
2426 <211> LENGTH: 145
2427 <212> TYPE: PRT
2428 <213> ORGANISM: Artificial Sequence
2430 <220> FEATURE:
2431 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Asp99
2433 <400> SEQUENCE: 63
2435 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2436 1 5 10 15
2439 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2440 20 25 30
2443 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2444 35 40 45
2447 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2448 50 55 60
2451 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2452 65 70 75 80
2455 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
2456 85 90 95
2459 Thr Thr Cys Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2460 100 105 110
2463 Pro Arg Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2464 115 120 125
2467 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2468 130 135 140 *145*

2470 <210> SEQ ID NO: 64
2471 <211> LENGTH: 95
2472 <212> TYPE: PRT
C--> 2473 <213> ORGANISM: Artificial Sequence
2475 <220> FEATURE:
2476 <223> OTHER INFORMATION: An hCG alpha-subunit analog with Gly-Gly-Cys at its carboxyterminus
2478 <400> SEQUENCE: 64
2480 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro

Artificial

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/797,553

DATE: 07/22/2004
TIME: 08:56:03

Input Set : A:\10797553.txt
Output Set: N:\CRF4\07222004\J797553.raw

2481 1 5 10 15
 2483 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
 2484 20 25 30
 2486 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
 2487 35 40 45
 2489 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
 2490 50 55 60
 2492 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
 2493 65 70 75 80
 2495 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser Gly Gly Cys
 E--> 2496 86 90 85 95 90 95

Artificial

2499 <210> SEQ ID NO: 65

2500 <211> LENGTH: 92

2501 <212> TYPE: PRT

C--> 2502 <213> ORGANISM: Artificial Sequence

2504 <220> FEATURE:

2505 <223> OTHER INFORMATION: An hCG alpha-subunit analog with Asp in place of Asn52 and Cys in place of Ser92

2507 <400> SEQUENCE: 65
 2509 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
 2510 1 5 10 15
 2512 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
 2513 20 25 30
 2515 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
 2516 35 40 45
 2518 Val Gln Lys Asp Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
 2519 50 55 60
 2521 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
 2522 65 70 75 80
 2524 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser

E--> 2525 87 90 85 90

2528 <210> SEQ ID NO: 66

2529 <211> LENGTH: 145

2530 <212> TYPE: PRT

2531 <213> ORGANISM: Artificial Sequence

2533 <220> FEATURE:

2534 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Ser96 and hFSH beta-subunit residues 95-108 for hCG beta-subunit residues 101-108

2536 <400> SEQUENCE: 66
 2538 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
 2539 1 5 10 15
 2542 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
 2543 20 25 30
 2546 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
 2547 35 40 45
 2550 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
 2551 50 55 60
 2554 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
 2555 65 70 75 80
 2558 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Cys
 2559 85 90 95

Ser is
at 96
location.

LAST sequence in submitted file. See

PAGE 10 a 150.

~~See~~

~~PAGE~~

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/797,553

DATE: 07/22/2004
TIME: 08:56:03

Input Set : A:\10797553.txt
Output Set: N:\CRF4\07222004\J797553.raw

2562 Thr Thr Asp Cys Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe
2563 100 105 110
2566 Gly Glu Phe Gln Asp Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2567 115 120 125
2570 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2571 130 135 140 *145*

RAW SEQUENCE LISTING ERROR SUMMARY DATE: 07/22/2004
PATENT APPLICATION: US/10/797,553 TIME: 08:56:04

Input Set : A:\10797553.txt
Output Set: N:\CRF4\07222004\J797553.raw

Invalid Line Length:

The rules require that a line not exceed 72 characters in length. This includes spaces.

Seq#:24; Line(s) 785
Seq#:57; Line(s) 2173
Seq#:65; Line(s) 2505
Seq#:66; Line(s) 2534

VARIABLE LOCATION SUMMARY
PATENT APPLICATION: US/10/797,553

DATE: 07/22/2004
TIME: 08:56:04

Input Set : A:\10797553.txt
Output Set: N:\CRF4\07222004\J797553.raw

Use of n's or Xaa's (NEW RULES):

ERROR EXPLANATION: ②

Use of n's and/or Xaa's have been detected in the Sequence Listing.

Use of <220> to <223> is MANDATORY if n's or Xaa's are present.

in <220> to <223> section, please explain location of n or Xaa, and which residue n or Xaa represents.

VERIFICATION SUMMARY
PATENT APPLICATION: US/10/797,553

DATE: 07/22/2004
TIME: 08:56:04

Input Set : A:\10797553.txt
Output Set: N:\CRF4\07222004\J797553.raw

L:10 M:270 C: Current Application Number differs, Replaced Current Application Number
L:11 M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:786 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:24 ✓
M:332 Repeated in SeqNo=24
L:806 M:252 E: No. of Seq. differs, <211> LENGTH:Input:92 Found:184 SEQ:24 ✓
L:1223 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:36 ✓
L:1269 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:37 ✓
L:1317 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:38 ✓
L:1366 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:39 ✓
L:1768 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:45 ✓
L:1906 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:48 ✓
L:2162 M:258 W: Mandatory Feature missing, <222> Tag not found for SEQ ID#:56 ✓
L:2162 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:56 after pos.:0 ✓
L:2162 M:333 E: Wrong sequence grouping, Amino acids not in groups! ✓
L:2163 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:56 ✓
L:2170 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:57 ✓
L:2193 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:57 ✓
M:332 Repeated in SeqNo=57
L:2196 M:252 E: No. of Seq. differs, <211> LENGTH:Input:92 Found:107 SEQ:57 ✓
L:2241 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:58 ✓
L:2287 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:59 ✓
L:2333 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:60 ✓
L:2378 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:61 ✓
L:2423 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:62 ✓
L:2468 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:63 ✓
L:2473 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:64 ✓
L:2496 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:64 ✓
L:2502 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:65 ✓
L:2525 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:65 ✓
L:2571 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:66 ✓
L:13 M:203 E: No. of Seq. differs, <160> Number Of Sequences:Input (56) Counted (66) ✓